

California Regional Water Quality Control Board, Los Angeles Region

**Calleguas Creek Reach 9A, Camrosa Diversion
Dissolved Oxygen (Delisting)**

Summary of Proposed Action

Calleguas Creek Reach 9A, or Camrosa Diversion, extends from the confluence with Calleguas Creek Reach 2 to the start of Calleguas Creek Reach 9B, Conejo Creek, at the Camrosa Diversion. Calleguas Creek Reach 9A is proposed to be **removed** from the 2002 305(b) water quality assessment as it is fully supporting (not impaired) as it meets the Basin Plan objective for dissolved oxygen. The beneficial use affected by this action is aquatic life.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Calleguas Creek Reach 9A - Camrosa Diversion	Pollutants/Stressors	Dissolved Oxygen
Hydrologic Unit	403.12	Source(s)	NA
Total Waterbody Size	100.1 Miles + Estuary	TMDL Priority	TMDL Analytical Unit 1
Size Affected	1.7 Miles	TMDL Start Date (Mo/Yr)	NA
Extent of Impairment	Entire reach	TMDL End Date (Mo/Yr)	NA

Watershed Characteristics

Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge; the southern boundary is formed by the Simi Hills and Santa Monica Mountains.

Calleguas Creek Reach 9A, or Camrosa Diversion, extends from the confluence with Calleguas Creek Reach 2 to the start of Calleguas Creek Reach 9B, Conejo Creek, at the Camrosa Diversion. Camrosa WWTP discharges to percolation ponds near downstream.

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Water Quality Objectives Now Attained.

The Basin Plan limits for dissolved oxygen read as follows: "At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.

"The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges."

Reach 9 is designated as having intermittent warm freshwater habitat.

Beneficial Uses Affected

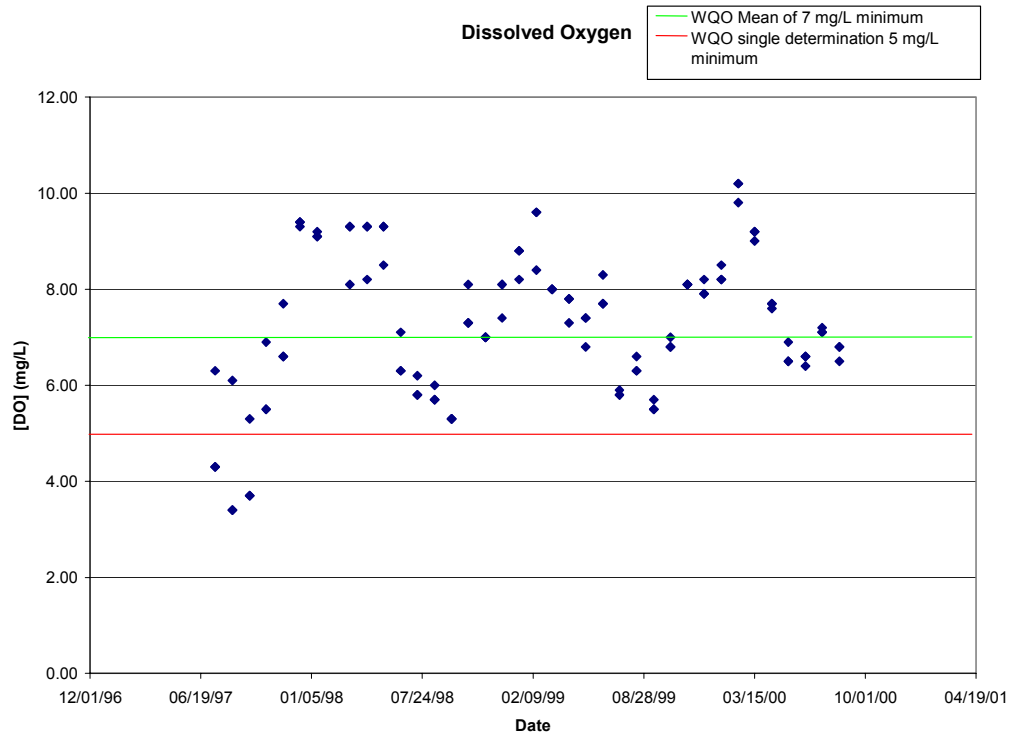
- Warm freshwater habitat

Data Assessment

Table 2. Summary of Dissolved Oxygen for Calleguas Creek Reach 9A - Conejo Creek Camrosa Diversion.

Dates of Sampling	7/97-8/00
Number of Samples (n)	111
Minimum Data Value	3.4 mg/L
Maximum Data Value	10.2 mg/L
Median Data Value	7.3 mg/L
Arithmetic Mean Value	7.3 mg/L
Standard Deviation	1.51 mg/L
Number (Percent) above Objective	6 samples or 5.5% have levels less than 5 mg/L.

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Potential Sources

NA

References

Calleguas Creek Chloride TMDL 2001

Camarillo WWTP NPDES Reports

Basin Plan 1994

Watershed Management Initiative Chapter 2000

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**Calleguas Creek Reach 10, Conejo Creek, Hill Canyon
Dissolved Oxygen (Delisting)**

Summary of Proposed Action

The Hill Canyon reach of Conejo Creek, also called Calleguas Creek Reach 10, extends from the confluence with Arroyo Santa Rosa to the confluence with the North Fork of Conejo Creek, and includes the North Fork to just above the Hill Canyon Wastewater Treatment Facility (WWTF). This reach is proposed to be **removed** from the 2002 305(b) water quality assessment as it is fully supporting (not impaired) as it meets the Basin Plan objective for dissolved oxygen. The beneficial use affected by this impairment is warm water habitat (WARM).

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Calleguas Creek Reach 10	Pollutants/Stressors	Dissolved Oxygen
Hydrologic Unit	403.64	Source(s)	NA
Total Waterbody Size	100.1 Miles + Estuary	TMDL Priority	TMDL Analytical Unit 1
Size Affected	3.4 Miles	TMDL Start Date (Mo/Yr)	NA
Extent of Impairment	Entire Reach	TMDL End Date (Mo/Yr)	NA

Watershed Characteristics

Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge; the southern boundary is formed by the Simi Hills and Santa Monica Mountains.

Land uses vary throughout the watershed. Urban developments are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Although some residential development has occurred along the slopes of the watershed, most upland areas are still open space, however, golf courses are becoming increasingly popular to

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locate in these open areas. Agricultural activities, primarily cultivation of orchards and row crops, are spread out along valleys and on the Oxnard Plain.

Water sources for Reach 10 include water from upstream Arroyo Conejo North and South Forks, Reaches 12 and 13, urban and agricultural runoff, and effluent from Hill Canyon WWTF.

Water Quality Objectives Now Attained

The Basin Plan limits for dissolved oxygen read as follows: "At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.

"The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges."

Reach 10 is designated as having existing warm freshwater habitat.

Beneficial Uses Affected

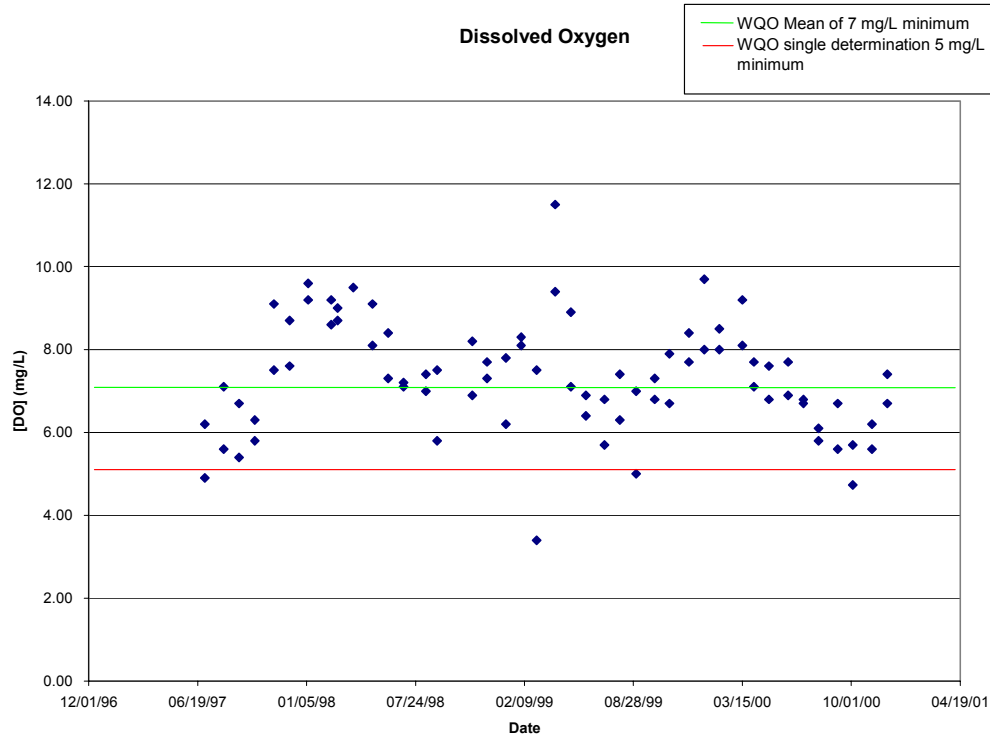
- Warm freshwater habitat.

Data Assessment

Table 2. Summary of Dissolved Oxygen Data for Calleguas Creek Reach 10.

Dates of Sampling	7/97-12/00
Number of Samples (n)	81
Minimum Data Value	3.4 mg/L
Maximum Data Value	11.5 mg/L
Median Data Value	7.3 mg/L
Arithmetic Mean Value	7.33 mg/L
Standard Deviation	1.35 mg/L
Number (Percent) above Objective	3 samples or 4% were below the criteria of 5 mg/L.

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Potential Sources

NA

References

Calleguas Creek Chloride TMDL 2001
Basin Plan 1994
Watershed Management Initiative Chapter 2000
Calleguas Creek Ambient Water Quality Monitoring
Hill Canyon WWRP NPDES Report

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**Calleguas Creek Reach 11, Arroyo Santa Rosa
Dissolved Oxygen (Delisting)**

Summary of Proposed Action

Calleguas Creek Reach 11, or Arroyo Santa Rosa, extends from the headwaters to Reach 10, Conejo Creek Hill Canyon, where it connects only during periods of high flow. Calleguas Creek Reach 11 is proposed to be **removed** from the 2002 305(b) water quality assessment as it is fully supporting (not impaired) as it meets the Basin Plan objective for dissolved oxygen. The beneficial use affected by this impairment is warm water habitat (WARM).

Table 1. 303 (d) Listing/TMDL Information

Waterbody Name	Calleguas Creek Reach 11 - Arroyo Santa Rosa	Pollutants/Stressors	Dissolved Oxygen
Hydrologic Unit	403.63 403.64 403.65 403.67	Source(s)	NA
Total Waterbody Size	100.1 Miles + Estuary	TMDL Priority	TMDL Analytical Unit 1
Size Affected	10.2 Miles	TMDL Start Date (Mo/Yr)	NA
Extent of Impairment	Entire reach	TMDL End Date (Mo/Yr)	NA

Watershed Characteristics

Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The northern boundary of the watershed is formed by the Santa Susana Mountains, South Mountain, and Oak Ridge; the southern boundary is formed by the Simi Hills and Santa Monica Mountains.

Calleguas Creek Reach 11, or Arroyo Santa Rosa, extends from the headwaters to Reach 10, Conejo Creek Hill Canyon, where it connects only during periods of high flow. The

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confluence with Reach 10 is usually dry. Olsen Road WRP currently discharges to this reach, but it is scheduled to be decommissioned, with its influent diverted to Hill Canyon WWTF.

Water Quality Objectives Now Attained.

The Basin Plan limits for dissolved oxygen read as follows: "At a minimum (see specifics below), the mean annual dissolved oxygen concentration of all waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.

"The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges."

Reach 11 is designated as having intermittent warm freshwater habitat.

Beneficial Uses Affected

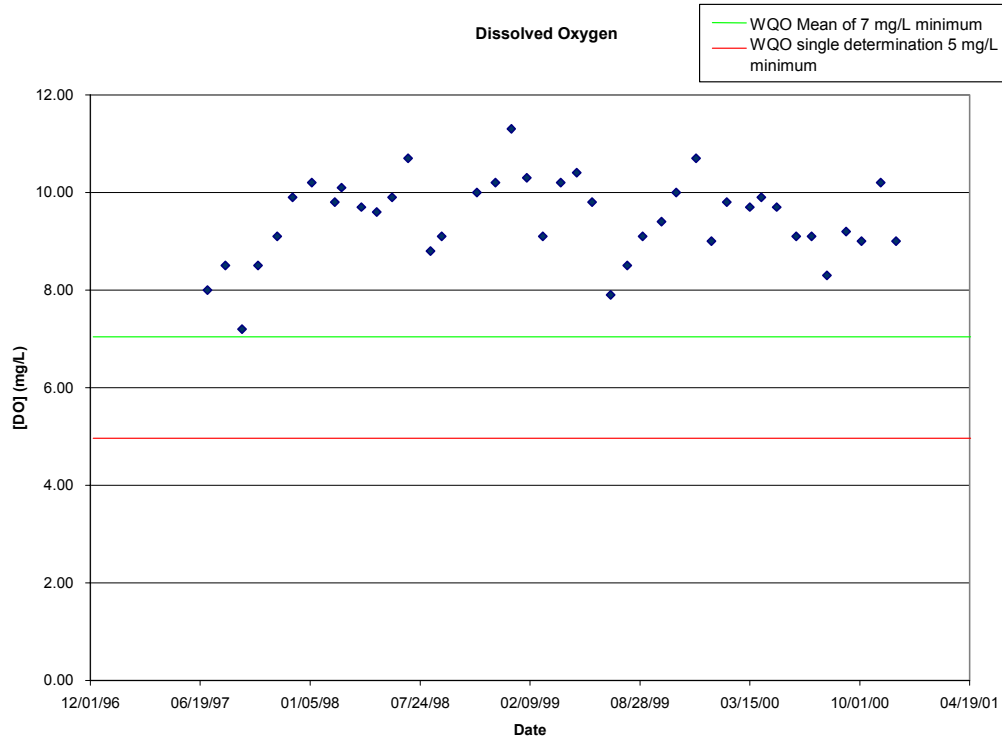
- Warm freshwater habitat

Data Assessment

Table 2. Summary of Dissolved Oxygen Data for Calleguas Creek Reach 11, Arroyo Santa Rosa.

Dates of Sampling	7/97-8/00
Number of Samples (n)	41
Minimum Data Value	7.2 mg/L
Maximum Data Value	11.3 mg/L
Median Data Value	9.7 mg/L
Arithmetic Mean Value	9.46 mg/L
Standard Deviation	0.84 mg/L
Number (Percent) above Objective	None, 0%.

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Potential Sources

NA.

References

Calleguas Creek Chloride TMDL 2001
Calleguas Creek Characterization Study 2000
Watershed Management Initiative Chapter 2000
Basin Plan (1994)

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**Calleguas Creek South – Reach 2
Water Column Toxicity**

Summary of Proposed Action

Delisting is proposed for Reach 2, Calleguas Creek South, for water column toxicity, which affects aquatic life beneficial uses.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Calleguas Creek R2	Pollutants/Stressors	Water Column Toxicity
Hydrologic Unit	403.12	Source(s)	N/A; delisting
Total Waterbody Size		TMDL Priority	N/A; delisting
Size Affected	4.4	TMDL Start Date (Mo/Yr)	N/A; delisting
Extent of Impairment	Entire reach	TMDL End Date (Mo/Yr)	N/A; delisting

Watershed Characteristics

Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The Santa Susana Mountains, South Mountain, and Oak Ridge form the northern boundary of the watershed; the Simi Hills and Santa Monica Mountains form the southern boundary.

Land uses vary throughout the watershed. Urban developments are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Although some residential development has occurred along the slopes of the watershed, most upland areas are still open space; however, golf courses are becoming increasingly popular to locate in these open areas. Agricultural activities, primarily cultivation of orchards and row crops, are spread out along valleys and on the Oxnard Plain.

Mugu Lagoon, located at the mouth of the watershed, is one of the few remaining significant saltwater wetland habitats in southern California. The Point Mugu Naval Air Base is located in the immediate area and the surrounding Oxnard Plain supports a large

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variety of agricultural crops. These fields drain into ditches that either enter the lagoon directly or through Calleguas Creek and its tributaries. Other fields drain into tile drain systems that discharge to drains or creeks. Also in the area of the base are freshwater wetlands created on a seasonal basis to support duck hunting clubs. The lagoon borders on an Area of Special Biological Significance (ASBS) and supports a great diversity of wildlife including several endangered birds and one endangered plant species. Except for the military base, the lagoon area is relatively undeveloped.

Supplies of ground water are critical to agricultural operations and industry (sand and gravel mining) in this watershed.

Pollutants from nonpoint sources have impacted aquatic life in both Mugu Lagoon and the inland streams of this watershed. DDT, PCBs, other pesticides, and some metals have been detected in both sediment and biota collected from surface waterbodies of this watershed. Additionally, ambient toxicity has been revealed in several studies from periodic toxicity testing in the watershed (ammonia from POTWs and pesticides such as diazinon and chlorpyrifos are implicated). Fish collected from Calleguas Creek and Revolon Slough exhibit skin lesions and have been found to have other histopathologic abnormalities. High levels of minerals and nitrates are common in the water column as well as in the groundwater. Sediment toxicity is also elevated in some parts of the lagoon. Reproduction is impaired in the resident endangered species, the light-footed clapper rail due to elevated levels of DDT and PCBs. Overall, this is a very impaired watershed. It appears that the sources of many of these pollutants are agricultural activities (mostly through continued disturbance and erosion of historically contaminated soils), which cover approximately 25% of the watershed along the inland valleys and coastal plain, although the nearby naval facility has also been a contributor. Other nonpoint sources include residential and urban activities, which are present over approximately 25% of the watershed. The remaining 50% of the watershed is still open space although there is a severe lack of benthic and riparian habitat.

Mugu Lagoon as well as the Calleguas Creek Estuary are considered candidate toxic hot spots under the Bay Protection and Toxic Cleanup Program ([BPTCP](#)) for reproductive impairment (the endangered clapper rail), exceedance of the state Office of Environmental and Health Hazard Assessment (OEHHA) advisory level for mercury in fish, and exceedance of other tissue guidelines for DDT in fish and sediment concentrations of DDT, PCB, chlordane, chlorpyrifos, sediment toxicity and degraded benthic infaunal community.

Primary issues related to POTW discharges include ammonia toxicity and high mineral content (i.e., salinity), the latter, in part, due to imported water supplies.

Water Quality Objectives Attained

New delisting resulting from testing one site downstream of Camrosa Wastewater Treatment Plant for chronic water column toxicity using the fathead minnow and *Ceriodaphnia* (see data assessment table for test results).

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Narrative objective listed in Basin Plan on page 3-16

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board will determine compliance with this objective.

The survival of aquatic life in surface waters, subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same waterbody in areas unaffected by the waste discharge or, when necessary, other control water.

There shall be no acute toxicity in ambient waters, including mixing zones. The acute toxicity objective for discharges dictates that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival when using an established USEPA, State Board, or other protocol authorized by the Regional Board.

There shall be no chronic toxicity in ambient waters outside mixing zones. To determine compliance with this objective, critical life stage tests for at least three species with approved testing protocols shall be used to screen for the most sensitive species. The test species used for screening shall include a vertebrate, an invertebrate, and an aquatic plant. The most sensitive species shall then be used for routine monitoring. Typical endpoints for chronic toxicity tests include hatchability, gross morphological abnormalities, survival, growth, and reproduction.

Effluent limits for specific toxicants can be established by the Regional Board to control toxicity identified under Toxicity Identification Evaluations (TIEs).

Beneficial Uses Affected

Aquatic life beneficial uses

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Data Assessment**Table 2. Summary of Water Column Toxicity Data for Calleguas Creek South (Reach 2)**

Dates of Sampling	August 1998-May 1999
Number of Samples (n)	6
Minimum Data Value	0 % mortality, 0 % reproduction or growth inhibition
Maximum Data Value	>0 % mortality, > 0% reproduction or growth inhibition
Median Data Value	
Arithmetic Mean Value	
Standard Deviation	
Percent above Objective	

Potential Sources**References**

Calleguas Creek Characterization Study (September 2000) Site 6 data

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**Conejo Creek – Reach 9A (tributary to Calleguas Creek)
(Lower part of former Conejo Creek Reach 1)
Water Column Toxicity**

Summary of Proposed Action

Delisting is proposed for Reach 9A, Conejo Creek, tributary to Calleguas Creek, for water column toxicity, which affects aquatic life beneficial uses.

Table 1. 303(d) Listing/TMDL Information

Waterbody Name	Conejo Creek	Pollutants/Stressors	Water Column Toxicity
Hydrologic Unit	403.12	Source(s)	N/A
Total Waterbody Size		TMDL Priority	N/A; delisting
Size Affected	1.7	TMDL Start Date (Mo/Yr)	N/A
Extent of Impairment	Entire reach	TMDL End Date (Mo/Yr)	N/A

Watershed Characteristics

Calleguas Creek and its major tributaries, Revolon Slough, Conejo Creek, Arroyo Conejo, Arroyo Santa Rosa, and Arroyo Simi drain an area of 343 square miles in southern Ventura County and a small portion of western Los Angeles County. This watershed, which is elongated along an east-west axis, is about 30 miles long and 14 miles wide. The Santa Susana Mountains, South Mountain, and Oak Ridge form the northern boundary of the watershed; the Simi Hills and Santa Monica Mountains form the southern boundary.

Land uses vary throughout the watershed. Urban developments are generally restricted to the city limits of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Although some residential development has occurred along the slopes of the watershed, most upland areas are still open space; however, golf courses are becoming increasingly popular to locate in these open areas. Agricultural activities, primarily cultivation of orchards and row crops, are spread out along valleys and on the Oxnard Plain.

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Mugu Lagoon, located at the mouth of the watershed, is one of the few remaining significant saltwater wetland habitats in southern California. The Point Mugu Naval Air Base is located in the immediate area and the surrounding Oxnard Plain supports a large variety of agricultural crops. These fields drain into ditches that either enter the lagoon directly or through Calleguas Creek and its tributaries. Other fields drain into tile drain systems that discharge to drains or creeks. Also in the area of the base are freshwater wetlands created on a seasonal basis to support duck hunting clubs. The lagoon borders on an Area of Special Biological Significance (ASBS) and supports a great diversity of wildlife including several endangered birds and one endangered plant species. Except for the military base, the lagoon area is relatively undeveloped.

Supplies of ground water are critical to agricultural operations and industry (sand and gravel mining) in this watershed.

Pollutants from nonpoint sources have impacted aquatic life in both Mugu Lagoon and the inland streams of this watershed. DDT, PCBs, other pesticides, and some metals have been detected in both sediment and biota collected from surface waterbodies of this watershed. Additionally, ambient toxicity has been revealed in several studies from periodic toxicity testing in the watershed (ammonia from POTWs and pesticides such as diazinon and chlorpyrifos are implicated). Fish collected from Calleguas Creek and Revolon Slough exhibit skin lesions and have been found to have other histopathologic abnormalities. High levels of minerals and nitrates are common in the water column as well as in the groundwater. Sediment toxicity is also elevated in some parts of the lagoon. Reproduction is impaired in the resident endangered species, the light-footed clapper rail due to elevated levels of DDT and PCBs. Overall, this is a very impaired watershed. It appears that the sources of many of these pollutants are agricultural activities (mostly through continued disturbance and erosion of historically contaminated soils), which cover approximately 25% of the watershed along the inland valleys and coastal plain, although the nearby naval facility has also been a contributor. Other nonpoint sources include residential and urban activities, which are present over approximately 25% of the watershed. The remaining 50% of the watershed is still open space although there is a severe lack of benthic and riparian habitat.

Mugu Lagoon as well as the Calleguas Creek Estuary are considered candidate toxic hot spots under the Bay Protection and Toxic Cleanup Program ([BPTCP](#)) for reproductive impairment (the endangered clapper rail), exceedance of the state Office of Environmental and Health Hazard Assessment (OEHHA) advisory level for mercury in fish, and exceedance of other tissue guidelines for DDT in fish and sediment concentrations of DDT, PCB, chlordane, chlorpyrifos, sediment toxicity and degraded benthic infaunal community.

Primary issues related to POTW discharges include ammonia toxicity and high mineral content (i.e., salinity), the latter, in part, due to imported water supplies.

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Water Quality Objectives Attained

Delisting resulting from testing two sites (one upstream and one downstream of Camarillo Water Reclamation Plant) for chronic water column toxicity using the fathead minnow and Ceriodaphnia.

Narrative objective listed in Basin Plan on page 3-16

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in, human, plant, animal, or aquatic life. Use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the State or Regional Board will determine compliance with this objective.

The survival of aquatic life in surface waters, subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same waterbody in areas unaffected by the waste discharge or, when necessary, other control water.

There shall be no acute toxicity in ambient waters, including mixing zones. The acute toxicity objective for discharges dictates that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival when using an established USEPA, State Board, or other protocol authorized by the Regional Board.

There shall be no chronic toxicity in ambient waters outside mixing zones. To determine compliance with this objective, critical life stage tests for at least three species with approved testing protocols shall be used to screen for the most sensitive species. The test species used for screening shall include a vertebrate, an invertebrate, and an aquatic plant. The most sensitive species shall then be used for routine monitoring. Typical endpoints for chronic toxicity tests include hatchability, gross morphological abnormalities, survival, growth, and reproduction.

Effluent limits for specific toxicants can be established by the Regional Board to control toxicity identified under Toxicity Identification Evaluations (TIEs).

Beneficial Uses Affected

Aquatic life uses

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Data Assessment**Table 2. Summary of Water Column Toxicity Data for Conejo Creek (Reach 9A of Calleguas Creek watershed)**

Dates of Sampling	July 1997-August 2000
Number of Samples (n)	26 (13 each mortality & reproduction endpoints)
Minimum Data Value	0 % mortality, 0 % reproduction inhibition
Maximum Data Value	58 % mortality, 32 % reproduction inhibition
Median Data Value	
Arithmetic Mean Value	
Standard Deviation	
Percent above Objective	

Potential Sources

N/A

References

Camarillo POTW receiving water data (sites W15 and W16) and Calleguas Creek Characterization Study (September 2000) (site 12). There was some data overlap.